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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/330,231	06/10/1999	ROBERTO PASSERONE	3964-US	9152
23639	7590	08/09/2005	EXAMINER	
BINGHAM, MCCUTCHEN LLP THREE EMBARCADERO CENTER 18 FLOOR SAN FRANCISCO, CA 94111-4067			KING, JUSTIN	
			ART UNIT	PAPER NUMBER
			2111	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/330,231

Applicant(s)

PASSERONE ET AL.

Examiner

Justin I. King

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed first and second electronic circuit building blocks must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-9, 11-19, 21-22, 23-24, 26-28, 30-32, 34-35, and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the admitted prior art J. Akella et al.'s Synthesizing Converters Between Finite State Protocols and Netravali et al. (U.S. Patent No. 5,680,552).

Referring to claim 1: Synthesizing Converters Between Finite State Protocols by Akella discloses two finite state machines and a third finite state machine for a method of transferring valid data (page 411, Section 2) for an inter-process communication within a computer system. The finite state machine (FSM, also known as automaton) has been long used for data processing simulation; Akella discloses that each protocol's FSM has an input side (page 411, Section 2, line 4), which is the receiving a first and second representation using regular expression; and Akella further discloses that each protocol is specified by their corresponding FSM (page 411, Section 2, lines 1-3), which is equivalent to the claimed generating the first and second FSM.

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Akella uses FSMs representing the system components, which are equivalent to the reusable electronic circuit building block.

Akella discloses an interface converter between the two different protocols (page 411, Section 2, lines 7-9), but Akella does not explicitly disclose *automatically* synthesizing the interface between the first and second protocols based on the first and second finite automata in the disclosed section.

Netravali discloses that it is known to automatically synthesize the protocol converter (column 1, lines 36-67, column 2, lines 1-7). Netravali teaches one to automatically generate a system having a protocol converter to implement a super-set of services to accommodate all services available to the users (column 2, lines 8-16). Netravali discloses automatically synthesizing an interface between the structurally different first and second protocols based on the first and second finite automata (figures 3 and 4, column 8, lines 29-60, column 9, lines 8-67, column 10, lines 1-60). The messages from two different network protocols with mismatches are the claimed data type with different structures.

Hence, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the invention to adapt Netravali's teaching to the Akella because Netravali enables one to automatically generate a system having a protocol converter to implement a super-set of services to accommodate all services available to the users, to construct the converter in a relatively short time, and to quickly adapt to changes in the protocol specification (column 1, lines 52-55).

Referring to claim 2: Claim 1's argument applies; furthermore, each FSM is designed to move to different states in responding to the input data, such inherent FSM behavior is the claimed automatically corresponding data from the first and second protocol.

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Referring to claim 3: Claims 1-2's arguments apply; furthermore, Netravali discloses that it is to know to translate data between two protocols and rectify any mismatches.

Referring to claims 4 and 31-32: Claims 1-2's arguments apply; furthermore, the initial state's identification, first sequence's identification, regular expression's derivative's constructions, and equivalent expressions' eliminations are the fundamental and basic steps for building a FSM; and Applicant did not challenge these FSM's basic steps.

Referring to claim 5: Claims 1-2 and 4's arguments apply; furthermore, collecting and integrating data are the fundamental and basic steps for data analysis in a FSM.

Referring to claim 6: Claims 1-2 and 4-5's arguments apply; furthermore, claim 6 is rejected over the claim 3's argument stated above.

Referring to claim 7: Claim 1's argument applies; furthermore, claim 7 is rejected over the claim 3's argument stated above.

Referring to claim 8: Claim 1's argument applies; furthermore, since the protocol converter (third FSM) converts two different protocols (first and second FSMs), either every state or selected states from the first and second FSMs will interface with each other via the third FSM. The initial state received by the third FSM from either the first or second FSM is the claimed selecting the interface state. Since the third FSM converts the messages between the first and second FSMs, it identifies the converting transition upon receiving a converting request; the converting transition is the claimed identifying all outgoing transitions, and the result of the converting transition is the claimed determining a new state for each outgoing transition; and repeating the converting transitions until all pending requests are completed.

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Referring to claim 9: Claims 1 and 8's arguments apply; furthermore, the third FSM represents the valid data transfers (specification, page 5, line 4), and in order for any data transfer to be valid, it cannot result in a data inconsistency.

Referring to claim 11: Claim 1's argument applies; furthermore, claim 11 is rejected over the claim 4's argument stated above.

Referring to claim 12: Synthesizing Converters Between Finite State Protocols by Akella discloses two finite state machines and a third finite state machine for a method of transferring valid data (page 411, Section 2) for an inter-process communication within a computer system. The finite state machine (FSM, also known as automaton) has been long used for data processing simulation; Akella discloses that each protocol's FSM has an input side (page 411, Section 2, line 4), which is the receiving a first and second representation using regular expression; and Akella further discloses that each protocol is specified by their corresponding FSM (page 411, Section 2, lines 1-3), which is equivalent to the claimed generating the first and second FSM. Akella uses FSMs representing the system components, which are equivalent to the reusable electronic circuit building block.

Akella discloses an interface converter between the two different protocols (page 411, Section 2, lines 7-9), but Akella does not explicitly disclose *automatically* synthesizing the interface between the first and second protocols based on the first and second finite automata in the disclosed section.

Netravali discloses that it is known to automatically synthesize the protocol converter (column 1, lines 36-67, column 2, lines 1-7). Netravali teaches one to automatically generate a system having a protocol converter to implement a super-set of services to accommodate all services available to the users (column 2, lines 8-16). Netravali discloses automatically

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synthesizing an interface between the structurally different first and second protocols based on the first and second finite automatons (figures 3 and 4, column 8, lines 29-60, column 9, lines 8-67, column 10, lines 1-60). The messages from two different network protocols with mismatches are the claimed data type with different structures.

Hence, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the invention to adapt Netravali's teaching to the Akella because Netravali enables one to automatically generate a system having a protocol converter to implement a super-set of services to accommodate all services available to the users, to construct the converter in a relatively short time, and to quickly adapt to changes in the protocol specification (column 1, lines 52-55).

Referring to claim 13: Claim 12's argument applies; furthermore, claim 13 is rejected over the claim 2's argument stated above.

Referring to claim 14: Claims 12-13's arguments apply; furthermore, the third FSM's converting function between different protocols is equivalent to the translation unit.

Referring to claim 15: Claims 12-13's arguments apply; furthermore, claim 15 is rejected over the claim 4's argument stated above.

Referring to claim 16: Claims 12-13 and 15's arguments apply; furthermore, claim 16 is rejected over the claim 5's argument stated above.

Referring to claim 17: Claim 12's argument applies; furthermore, claim 17 is rejected over the claim 14's argument stated above.

Referring to claim 18: Claim 18's argument applies; furthermore, claim 18 is rejected over the claim 8's argument stated above.

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Referring to claim 19: Claim 19's argument applies; furthermore, claim 19 is rejected over the claim 9's argument stated above.

Referring to claim 21: Claim 1's argument applies; furthermore, Avella and McMillan disclose a mean to generate an interface for converting different protocols. The converting processing is converting one or more permitted operations of the first and second automata.

Referring to claim 22: Claim 1's argument applies.

Referring to claims 23-24 and 26: The construction of the first and second FSMs are based on the behavioral aspects, and the generated interface is based on the communication aspects.

Referring to claim 27-28 and 30: Netravali discloses the OSI (column 1, lines 13, 30, and 36), which is at the system level.

Referring to claims 34-35: Since the interface receives the data from one protocol and converts to another protocol, the means to differentiate the incoming data and outgoing data is equivalent to the label data referencing by its initiating protocol.

Referring to claims 37-38: Akella discloses a protocol converter, such as the bus adapters (column 1, 4th line from bottom), which connects electronic circuit building blocks within a computer.

5. Claims 10, 20, 25, 29, 33, 36, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akella in view of Netravali, and in further view of Mano's Computer System Architecture and an Official Notice.

Referring to claim 10: Claims 1 and 8's arguments apply; as stated in the claim 1's argument, the identifying the non-deterministic transition and determine a transition state for

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each input are fundamental practices in FSM's construction. However, Akella and Netravali do not explicitly mention converting the non-deterministic transition to deterministic transitions and the associated priority.

Since Akella and Netravali employ finite state machine for protocol conversion, one would have to know the practice of the finite state machine in order to practice Akella and Netravali's teachings. An Office Notice is taken on the following: it is a known finite state machine practice at the time Applicant made the invention to convert an existing non-deterministic finite state machine into a deterministic finite state machine to reduce the uncertainties and to implement a simpler machine.

The Computer System Architecture, as a popular academic textbook, discloses that it is a well-known practice to implement the priority setting in each system. The Computer System Architecture teaches one to allocate the system resource according to the time sensitivity of the task.

Thus, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the invention to adopt the practices of priority and to convert the NFS to FS into the Akella and Netravali because it enables the system to allocate resource to tasks according to their time sensitivities and to eliminate state transition uncertainty.

Referring to claim 20: Akella and Netravali's disclosures are stated above. While identifying the non-deterministic transition and determine a transition state for each input are fundamental practices in FSM's construction, Akella and Netravali do not explicitly disclose converting the non-deterministic transition and prioritizing the task.

Since Akella and Netravali employ finite state machine for protocol conversion, one would have to know the practice of the finite state machine in order to practice Akella and

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Netravali's teachings. An Office Notice is taken on the following: it is a known finite state machine practice at the time Applicant made the invention to convert an existing non-deterministic finite state machine into a deterministic finite state machine to reduce the uncertainties and to implement a simpler machine.

The Computer System Architecture, as a popular academic textbook, discloses that it is a well-known practice to implement the priority setting in each system. The Computer System Architecture teaches one to allocate the system resource according to the time sensitivity of the task.

Thus, it would have been obvious to one having ordinary skill in the computer art at the time Applicant made the invention to adopt the practices of priority and converting the NFS to DFS into the Akella and Netravali because it enables the system to allocate resource to tasks according to their time sensitivities and to eliminate state transition uncertainty.

Referring to claim 25: The construction of the first and second FSMs are based on the behavioral aspects, and the generated interface is based on the communication aspects.

Referring to claim 29: Netravali discloses the OSI (column 1, lines 13, 30, and 36), which is at the system level.

Referring to claim 33: The initial state's identification, first sequence's identification, regular expression's derivative's constructions, and equivalent expressions' eliminations are the fundamental and basic steps for building a FSM; and Applicant did not challenge these FSM's basic steps.

Referring to claim 36: Since the interface receives the data from one protocol and converts to another protocol, the means to differentiate the incoming data and outgoing data is equivalent to the label data referencing by its initiating protocol.

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Referring to claim 39: Akella discloses a protocol converter, such as the bus adapters (column 1, 4th line from bottom), which connects electronic circuit building blocks within a computer.

Response to Arguments

6. In response to Applicant's argument that claim 21 is depending on 20 and request for further clarification on claim 21's rejection (Remark, page 10, Section I, 2nd paragraph): To the contrary of Applicant's insertion, claim 21 is depending on claim 1 instead of claim 20; therefore, claim 21's rejection is not related to claim 20's rejection.

7. In response to Applicant's argument that Akella does not disclose or suggest "automatically" limitations (Remark, pages 10-11, Section A, page 13, Section D) and teaches away from it (Remark, page 11, Section B): As Applicant should have been aware of claims are rejected under 103(a) rather 102; therefore Applicant's concern regarding Akella's deficiency on the "automatically" is cured by the secondary reference. Akella's omission of the automatically means does not preclude the application and improvement of the automatically means; thus, Akella does not teach away from it.

8. In response to Applicant's argument that Netravali does not disclose or suggest data messages exchange between first and second electronic circuit building blocks (Remark, page 12, Section C): The primary reference Akella discloses the circuit building blocks. Akella discloses bus adapters as the protocol converters; and the bus adapters are used to connect circuit building blocks.

9. In response to Applicant's argument that Netravali is not related to the electronic circuit or IP blocks (Remark, page 13, 2nd paragraph): Akella, as the primary reference, discloses bus

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adapters, gateway, and bridges as protocol converters (column 1, lines 3-4 from bottom); and the bus adapters are used to connect circuit building blocks. Although Netravali discloses the embodiment as a network gateway; Netravali, as a secondary reference, teaches the automatically converting protocol.

10. In response to Applicant's argument that invalid/useless operations are not non-deterministic transitions (Remark, page 14, last paragraph): The argument was previous presented and the previous Office Action has responded to this argument with a revised Office Action and a newly added prior art Al-Karmic. The prior art Al-Karmic discloses that it is known to eliminate the non-deterministic transitions by converting the non-deterministic transition to multiple deterministic transitions (column 5, lines 6-13).

11. In response to Applicant's argument that Al-Karmi's constructing a new deterministic FSM from non-deterministic FSM is not eliminating non-deterministic transaction (Remark, page 15, 2nd paragraph): Converting an existing non-deterministic finite state machine (NFA) into a deterministic finite state machine (DFA) for the purpose of implementing simpler machine is a fundamental finite state machine practice. The NFA will no longer exist at the end of the conversion; therefore, converting a NFA into a DFA is eliminating the NFA.

12. In response to Applicant's argument that Al-Karmi is an irrelevant OCR invention (Remark, page 15, 3rd paragraph): The Office Action has been revised accordingly.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,862,251 to Al-Karmi: Al-Karmi discloses a FSM application, wherein it discloses that it is known to identify and to convert the non-deterministic transition to multiple deterministic transitions (column 5, lines 8-9). Al-Karmi teaches one to implement a simpler machine by converting an existing non-deterministic FSM into a deterministic FSM.

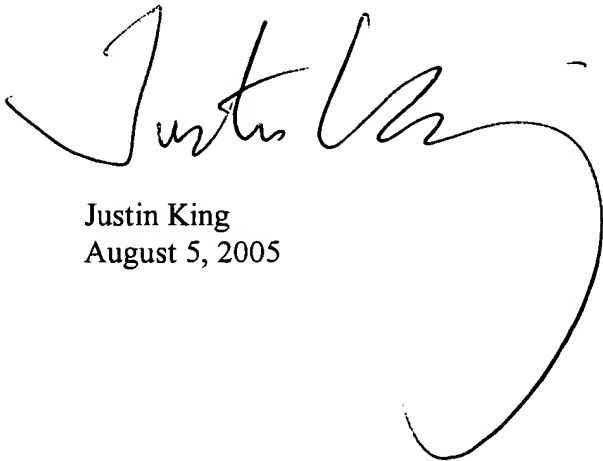
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin I. King whose telephone number is 571-272-3628. The examiner can normally be reached on Monday through Friday, 9:00 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on 571-272-3632 or on the central telephone number, (571) 272-2100. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lastly, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign

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patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

A large, stylized handwritten signature in black ink, appearing to read 'Justin King', with a long, sweeping underline that extends to the right.

Justin King
August 5, 2005

A handwritten signature in black ink, appearing to read 'Khanh Dang', written in a cursive style.

Khanh Dang
Primary Examiner